Claims

1. A method for controlling a data unit oriented communication between a sender and a receiver operating in accordance with a predetermined communication protocol, where

   said sender divides an amount of data to be sent into one or more data units having a structure determined by said protocol,

   said receiver acknowledges the correct receipt of data units by returning acknowledgment data units to said sender,

   said data units are sent by said sender in accordance with a flow control procedure conducted on the basis of one or more adaptive parameters and said acknowledgment data units, and

   said flow control procedure comprises a data loss detection mechanism capable of detecting data loss in said communication, said data loss detection mechanism being triggered to indicate the potential loss of data by one or more predetermined events, where in response to the triggering of said data loss detection mechanism a corresponding response procedure is conducted, said response procedure comprising at least two different modes for adapting said one or more adaptive parameters.

2. A method according to claim 1, wherein said data loss detection mechanism is a time out mechanism, such that after a data unit is sent, said sender monitors a time out period and if no acknowledgment data unit

associated with said data unit is received before said time out period expires, said time out mechanism is triggered.

3. A method according to claim 1, wherein said data loss

detection mechanism is a duplicate acknowledgment detection mechanism, such that said sender monitors the received acknowledgments, and if a data unit is acknowledged a predetermined number of times, said duplicate acknowledgment detection mechanism is triggered.

4. A method according to claim 2 or 3, wherein said response procedure comprises the retransmission of a given data unit.

5. A method according to claim 4, wherein the decision on

which of said at least two modes to choose for adapting said adaptive parameters is made on the basis of one or more acknowledgment data units received by said sender after having retransmitted said given data unit.

6. A method according to claim 2, wherein said time out period is one of said adaptive parameters.

7. A method according to one of claims 1 to 6, wherein said

flow control procedure is window based, and one or more flow control windows are among said adaptive parameters.

8. A method according to claim 5, wherein said at

least two modes consist of a first and a second
mode, said first mode being associated with the
judgment that the triggering event was caused by the
loss of said given data unit, and said second mode
being associated with the judgment that said given
data unit or the acknowledgment data unit for said
given data unit has been excessively delayed.

9. A method according to claim 8, wherein said sender
marks

    data units being sent such that an original
transmission may be distinguished from a
retransmission, and said receiver correspondingly
marks the acknowledgment data units, such that the
acknowledgment of an originally sent data unit may
be distinguished from the acknowledgment of the
retransmission of said data unit.

10. A method according to claim 9, wherein the sender
marks

    data units by including a time stamp in each sent
data unit, said time stamp indicating the time said
data unit was sent, and the receiver marks the
acknowledgment data unit for a received data unit by
including the time stamp contained in said received
data unit in the acknowledgment data unit for said
received data unit.

11. A method according to claim 9, wherein the sender
marks

    data units by including a bit string in each sent
data unit, said bit string having at least two
different values for distinguishing between an
original transmission and a retransmission, and the
receiver marks the acknowledgment data unit for a
received data unit by including the bit string

contained in said received data unit in the
acknowledgment data unit for said received data
unit.

12. A method according to claim 11, wherein said bit
string

consists of a single bit.

13. A method according to claim 11, wherein said bit
string

consists of a plurality of bits, such that said bit
string is capable of distinguishing between
different retransmissions.

14. A method according to one of claims 10 to 13,
wherein said

first mode is chosen if the first acknowledgment
data unit associated with said given data unit that
is received after having retransmitted said given
data unit acknowledges the retransmission of said
given data unit, and said second mode is chosen if
the first acknowledgment data unit associated with
said given data unit that is received after having
retransmitted said given data unit acknowledges the
original transmission of said given data unit.

15. A method according to claim 8, wherein

the sender measures the round trip time associated
with the connection for sending of said amount of
data,

the time between the retransmission of said given
data unit and the receipt of the first
acknowledgment data unit associated with said given
data unit is determined and compared to a value

derived from one or more of said round trip time
measurements, and

said first or second mode is chosen on the basis of
the result of said comparison.

16. A method according to claim 15, wherein said value
derived
from said round trip time measurements is the
shortest round trip time for the connection, and the
second mode is chosen if said time between the
retransmission of said given data unit and the
receipt of the first acknowledgment data unit
associated with said given data unit is smaller than
a predetermined fraction of said smallest round trip
time.

17. A method according to one of claims 8 to 16, wherein
the
second mode comprises adapting the time out period
on the basis of the time that elapsed between the
original transmission of said given data unit and
the receipt of the first acknowledgment data unit
associated with said given data unit.

18. A method according to one of claims 8 to 17, wherein
the
flow control procedure is window based and a
congestion window is used, where the value of said
congestion window at the time of said triggering
event is stored after said triggereing event
occurred and subsequently said value of the
congestion window is reset to a predetermined value,
and if said second mode is chosen after having
received the first acknowledgment data unit
associated with said given data unit, said value of

said congestion window is set to the value it would have assumed, had the response procedure not taken place.

19. A communication device for data unit oriented communication in accordance with a predetermined communication protocol, where said communication protocol prescribes that the sender in a communication divides an amount of data to be sent into one or more data units having a structure determined by said protocol and the receiver in said communication acknowledges the correct receipt of data units by returning acknowledgment data units to the sender,

where said communication device, when acting as a sender, is arranged to send data units in accordance with a flow control procedure that is conducted on the basis of one or more adaptive parameters and said acknowledgment data units, said flow control procedure comprising a data loss detection mechanism capable of detecting data loss in said communication, said data loss detection mechanism being triggered to indicate the potential loss of data by one or more predetermined events, where in response to the triggering of said data loss detection mechanism a corresponding response procedure is conducted, said response procedure comprising at least two different modes for adapting said one or more adaptive parameters.

20. A device according to claim 19, wherein said data loss

detection mechanism is a time out mechanism, such that after a data unit is sent, said device when acting as a sender monitors a time out period and if

no acknowledgment data unit associated with said
data unit is received before said time out period
expires, said time out mechanism is triggered.

21. A device according to claim 19, wherein said data
loss

detection mechanism is a duplicate acknowledgment
detection mechanism, such that said device when
acting as a sender monitors the received
acknowledgments, and if a data unit is acknowledged
a predetermined number of times, said duplicate
acknowledgment detection mechanism is triggered.

22. A device according to one of claims 19 to 21,
wherein said

response procedure comprises the retransmission of a
given data unit.

23. A device according to claim 22, wherein the decision
on

which of said at least two modes to choose for
adapting said adaptive parameters is made on the
basis of one or more acknowledgment data units
received by said sender after having retransmitted
said given data unit.

24. A device according to claim 20, wherein said time
out

period is one of said adaptive parameters.

25. A device according to one of claims 19 to 24,
wherein said

flow control procedure is window based, and one or
more flow control windows are among said adaptive
parameters.

26. A device according to claim 23, wherein said at
    least two modes consist of a first and a second
    mode, said first mode being associated with the
    judgment that the triggering event was caused by the
    loss of said given data unit, and said second mode
    being associated with the judgment that said given
    data unit or the acknowledgment data unit for said
    given data unit has been excessively delayed.

27. A device according to claim 26, wherein said device
when
    acting as a sender marks data units being sent such
    that an original transmission may be distinguished
    from a retransmission, and said device when acting
    as a receiver correspondingly marks the
    acknowledgment data units, such that the
    acknowledgment of an originally sent data unit may
    be distinguished from the acknowledgment of the
    retransmission of said data unit.

28. A device according to claim 27, wherein the device
when
    acting as a sender marks data units by including a
    time stamp in each sent data unit, said time stamp
    indicating the time said data unit was sent, and the
    device when acting as a receiver marks the
    acknowledgment data unit for a received data unit by
    including the time stamp contained in said received
    data unit in the acknowledgment data unit for said
    received data unit.

29. A device according to claim 27, wherein the device
when
    acting as a sender marks data units by including a
    bit string in each sent data unit, said bit string
    having at least two different values for

distinguishing between an original transmission and a retransmission, and the device when acting as a receiver marks the acknowledgment data unit for a received data unit by including the bit string contained in said received data unit in the acknowledgment data unit for said received data unit.

30. A device according to claim 28 or 29, wherein said first

mode is chosen if the first acknowledgment data unit associated with said given data unit that is received after having retransmitted said given data unit acknowledges the retransmission of said given data unit, and said second mode is chosen if the first acknowledgment data unit associated with said given data unit that is received after having retransmitted said given data unit acknowledges the original transmission of said given data unit.

31. A device according to claim 26, wherein

the device when acting as a sender measures the round trip time associated with the connection for sending of said amount of data,

the time between the retransmission of said given data unit and the receipt of the first acknowledgment data unit associated with said given data unit is determined and compared to a value derived from one or more of said round trip time measurements, and

said first or second mode is chosen on the basis of the result of said comparison.

32. A device according to claim 31, wherein said value derived

from said round trip time measurements is the shortest round trip time for the connection, and the second mode is chosen if said time between the retransmission of said given data unit and the receipt of the first acknowledgment data unit associated with said given data unit is smaller than a predetermined fraction of said smallest round trip time.

33. A device according to one of claims 26 to 32, wherein the

second mode comprises adapting the time out period on the basis of the time that elapsed between the original transmission of said given data unit and the receipt of the first acknowledgment data unit associated with said given data unit.

34. A device according to one of claims 26 to 33, wherein the

flow control procedure is window based and a congestion window is used, where the value of said congestion window at the time of said triggering event is stored after said triggering event occurred and subsequently said value of the congestion window is reset to a predetermined value, and if said second mode is chosen after having received the first acknowledgment data unit associated with said given data unit, said value of said congestion window is set to the value it would have assumed, had the response procedure not taken place.